CLAIMS

What is claimed is:

1. A layered article, comprising:

a single crystal silicon comprising substrate;

a silicon oxynitride layer (SixNyOz) disposed on said silicon substrate, and

a single crystal group III-nitride layer disposed on said oxynitride layer.

2. The article of claim 1, wherein said silicon substrate is (111) oriented.

3. The article of claim 2, wherein said single crystal group III-nitride layer is a GaN layer.

4. The article of claim 1, wherein a thickness of said silicon oxynitride layer is from 15 to 40 angstroms.

5. The article of claim 1, further comprising an integrated electronic circuit built on said article.

6. The article of claim 1, further comprising an integrated optical or optoelectronic device built on said article.

7. A method for forming textured group III-nitride layers, comprising the steps of:

providing a single crystal silicon comprising substrate, said silicon substrate having a silicon dioxide layer disposed thereon;

converting said silicon dioxide layer to a silicon oxynitride (SixNyOz) layer, and

depositing a single crystal group III-nitride layer on said oxynitride layer.

8. The method of claim 7, wherein said silicon dioxide layer is a native oxide layer.

9. The method of claim 7, wherein said converting step comprises flowing NH_3 at a temperature below 575 C.

10. The method of claim 9, wherein said temperature is between 550 and 575 C.

11. The method of claim 7, wherein said converting step and said depositing step occur in the same reactor.

12. The method of claim 11, wherein said converting step and said depositing step are both performed in a temperature range from 550 to 575 C.

13. The method of claim 7, further comprising the step of a H_2 clean at a temperature of at least 500 C prior to said converting step.

14. The method of claim 7, wherein said group III-nitride layer comprises GaN.

15. The method of claim 7, wherein said silicon substrate is (111) oriented.